Cromley, J.G., & Synder-Hogan, L.E. (2010). Reading comprehension of scientific text: A domain-specific test of the direct and inferential mediation model of reading comprehension. *Journal of Educational Psychology,* 102(3), 687-700. doi: 10.1037/10019452

The authors of this article developed a series of tests to determine if the DIME model is useful for biology texts. Reading comprehension is an essential skill that students must have in order to be successful in school. Low scores and underperformance in science in United States schools compared to other countries has become a great concern to educators and administrators. The authors note that reading comprehension is crucial to improving science understanding and retention in students.

The direct and inferential mediation model (DIME) or reading comprehension incorporates several skills. The DIME model incorporates background knowledge, vocabulary, strategies, word reading fluency, and inference to improve reading comprehension. Each category has its own set of strategies. The authors investigated if the DIME model is a good tool to use for students reading science text. Scientific text is usually characterized by a large amount of vocabulary and descriptive text. The vocabulary found in scientific text is very technical and specific and are different from conservational vocabulary. It is not only the vocabulary that can cause issues with reading comprehension but also the fact that students are expected to make inferences throughout using knowledge they just obtained. The authors suggest that there needs to be an added path to the DIME model to fit with science text. That path the authors suggest is one that connects reading vocabulary to reading comprehension.

The participants in the study were 737 current or prospective students with biology majors and were enrolled in a first semester introductory biology course. The group consisted of 466 women, 266 men, and five that did not identify gender. Also out of the group, 47% spoke only English, 20% spoke another language together with English, and 33% spoke a language other than English. The participants were given a section about vertebrate immune system from a common science textbook. To gauge prior knowledge the participants performed a 40 minute think aloud activity. Multiple choice tests were given after the participants read the section. These tests measured reading comprehension, prior topic knowledge, reading vocabulary, and inference. To measure reading comprehension strategy use, the participants were asked to apply strategies of summarizing, predicting, self-questioning, prior topic knowledge activation, etc. Word reading fluency was measured by using a one minute group administered maze task.

The results of the tests indicated that the improved DIME model the authors used was a better fit than the previous model the authors had used in previous studies. The result showed that the modified DIME model had a statistically significant improvement over the original model. There was an indirect effect of prior knowledge, reading comprehension strategies, inference, and vocabulary on reading comprehension. The results also supported the importance of topic knowledge for reading comprehension of science texts.

The DIME model can be an essential tool in preparing lesson plans. It is important to teach and reinforce reading comprehension skills. The DIME model shows how different areas and skills are connected to increase reading comprehension. In lesson planning it is important to incorporate these areas and skills to increase understanding and retention. It is very important to use different strategies in science classes. Scientific texts use a lot of big, confusing terminology that students must understand in order to make inferences to the rest of the reading.

For my lesson plans I would break down the DIME model. For each new concept I would use different strategies to activate prior knowledge for example, a think aloud session where students will discuss what they know about the topic. I may have the students use KWL chart to see what they may already know about the topic and what they would like to learn about the topic. Vocabulary is very important in science. To help students understand and retain the meanings of the different vocabulary words I will have the students complete a glossary of key terms in their notebooks. I will have the students complete different review games such as jeopardy. I will also provide visual aids to help explain the different terms. I will have the class do hand on activities that applies the terms to the activity.

For reading strategies, there are numerous tools that I can have my students complete. Such strategies include: concept maps, summarizing, highlighting, re-reading, sentence combining, and questioning. For inference, I will ask the students different open ended questions. I will also ask many different critical thinking questions that make the students apply what they read to the questions. The DIME model shows have students must have the skills in background knowledge, word fluency, vocabulary, reading strategies, and inference in order to have reading comprehension. Therefore, as a teacher, I must use each part of the DIME model to ensure understanding and retention.